REMARKS

Claims 1-11 are in this application. Claim 1 has been amended. It is respectfully requested that this amendment be entered.

It is noted that the rejection of claims 2 and 3 under 35 USC 112 has been withdrawn.

The Examiner has rejected claims 1-3 as being anticipated by Ireland et al. (US Patent 4,041,097). Applicants respectfully traverse this rejection.

Contrary to what is stated by the Examiner on page 5 of the Official Action, the feedstock of Ireland is not the same as that of the claimed invention.

Ireland et al teaches a method of upgrading the products of Fischer-Tropsch synthesis. The method includes feeding the entire Fischer-Tropsch reactor hot effluent (produced in the zone 4) into a hydrocarbon separation (distillation) zone 12 - see column 2 lines 39 to 42 and column 7 lines 45 to 50. The feedstock to the zone 12 includes not only paraffinic hydrocarbons but also substantial proportions of other components such as olefinic hydrocarbons, aromatic hydrocarbons, oxygenates, etc - see, for example, column 1 line 10, column 2 line 13 to 25, column 2 line 46, column 2 line 61 ("naphtha" which includes hydrocarbons other than paraffins such as aromatic hydrocarbons), column 3 lines 16 to 19 (specifies that the side stream comprises heavy highly olefinic and paraffinic material), etc. In contrast, in the process of the present invention as claimed in Claim 1, the feedstock comprises substantially only paraffinic hydrocarbons, with at most only small proportions of other components such as olefins being present - see page 2 lines 12 to 17 as well as page 2 lines 25 to 28. Claim 1 is thus distinctive over Ireland et al on this basis, i.e. is not anticipated by Ireland.

The Examiner contends that Ireland et al (US 4,041,097) teaches the process of Claim 1, viz a process for separating a Fischer-Tropsch derived paraffinic hydrocarbon feedstock into an overhead stream, a side stream and a bottom stream,

with the side stream and the bottom stream comprising us able wax products. The Examiner further contends that any wax is usable so that the feature in Claim 1 that the wax is usable, is inherent in Ireland et al.

Firstly, it is respectfully submitted that the Examiner is not correct when he contends that any wax is useable. It is well known to persons skilled in the art that all waxes are **not** useable. For example, many waxes are thermally degraded, so that they are not directly useable - see, for example, page 2 lines 25-33. As discussed on page 2 lines 7-11, by "useable wax products" is meant that the wax products are non-thermally degraded and that they meet stringent specifications in respect of properties such as congealing point, softness at various temperatures, oil content, etc. as set out on page 1, line 17 to page 2, line 6.

As stated in the previous response, there is **no** teaching in Ireland et al that the bottoms product, which is withdrawn along the flow line 22, comprises useable wax products. Ireland et al specifies, in column 10 lines 59-63 that some of this bottoms material can be employed to maximize fuel oil products, by routing it to the hydrogenation stage 62 where it is subjected to catalytic hydrodewaxing. Clearly, this shows that the bottoms material does not comprise useable wax products.

The naphtha stream, which is withdrawn from the distillation zone 12 along the line 16 and the light fuel oil/jet fuel stream, which is withdrawn along the line 18, clearly do not contain useable wax products. The naphtha stream is treated further to produce gasoline, while the light fuel oil/jet fuel fraction is used to produce distillate fuel oil by hydrogenation thereof in the zone 62.

Thus, the only side stream from the distillation zone 12 in Ireland et al that could possibly contain wax products is the heavy fuel oil, which is withdrawn from the distillation zone 12 along the flow line 20. As indicated hereinbefore, this fraction boils in the range 600°F (about 316°C) to 850°F (about 454°C). Hydrocarbon compounds with a carbon number of 18 have a boiling point of about 316°C, and are liquids at room temperature (25°C). Thus, the heavy fuel oil fraction contains hydrocarbons with carbon numbers of 18, it is also liquid at room

temperature. This is confirmed in column 9 line 54 which specifies that this fraction is a heavy low fluidity fraction. A wax, in contrast, and as is well known to persons skilled in the art, is non-liquid or non-fluid, ie is solid, firm or plastic, at room temperature. Thus, the lowest carbon number hydrocarbon deemed to be a wax is typically C_{20}, which is firm or plastic, and definitely non-fluid, at room temperature. As indicated on page 3 line 28, the lowest carbon number of medium wax is C_{20}.

Although Ireland et al specifies that the fraction that is withdrawn along the line 20 is a "waxy feed" (column 9 line 56), it is respectfully submitted that a skilled person would not consider this fraction to be, or to comprise, a usable wax product. Ireland et al in fact confirms as much since it specifies that this fraction must be subjected to catalytic hydrodewaxing in the zone 68 where the heavy waxy feed is subjected to catalytic cracking to obtain dewaxed oil and gasoline. It is thus clear that the side stream that is withdrawn along the line 20 in Ireland et al does **not** comprise usable wax products as claimed in the process of Claim 1 of the present application. Still further, since Ireland et al specifies that a hydrocarbon having a boiling point of about 600°F is a **heavy** fuel oil product (column 7 lines 58/59) with the usable products obtained from this fraction being fuel oil and gasoline (column 9 lines 65/66) a person skilled in the art would clearly not consider any usable products present in the fraction withdrawn along the line 22 in Ireland et al as being usable wax products.

The process of Ireland et al is thus clearly different from that defined in Claim 1. The paraffinic hydrocarbons of the present invention are distilled into at least three fractions or streams, namely an overhead stream, a bottom stream comprising usable wax products, and at least one side stream comprising usable wax products. Ireland et al does not at all teach or suggest obtaining, through the distillation of Ireland et al, at least one side stream comprising usable wax products and a bottom stream also comprising usable wax products. In other words, Ireland et al does not at all teach or suggest multiple fractionation of Fischer-Tropsch waxes.

Furthermore, Ireland t al provides no details on how the zone or column 12 is operated. Thus, it does not provide any details of important operating parameters. The only details provided are in respect of the products or cuts that are withdrawn. In other words, it is not essential or critical, in Ireland et al, that the distillation column 12 be operated so that there is no thermal degradation of either the feedstock or of wax components present in the feedstock. Indeed, it is clear that thermal degradation is not critical in Ireland et al since Ireland et al does not deal at all with the production of usable wax products as is the case with the present invention. Thus, for example, in Ireland et al the heavy fuel oil component withdrawn from the distillation column 12 is specified as being highly olefinic and paraffinic (column 3, lines 18-19). Furthermore, this material is subjected to catalytic hydrodewaxing to convert the waxes present therein to fuel oil material as well as to gasoline components - column 9 lines 58 to 67. In contrast, it is crucial in the present invention that the distillation column be operated so that there is no thermal degradation of the feedstock or of the wax products. This feature of the invention is disclosed *inter alia* on page 4, lines 3-8, page 6, lines 20-28 and page 7, lines 16-20. Ireland produces different end products than the products which are produced in applicants process. Therefore, it is clear that different process parameters are required in each process. Therefore, it is respectfully requested that this rejection be withdrawn.

The Examiner rejected claims 4, 5 and 7-11 under 35 USC 103(a) in view of Ireland. Applicants respectfully traverse this rejection.

The Examiner states that it would have been obvious to one having ordinary skill in the art to have modified the Ireland process by utilizing the claimed operating conditions because the operating conditions of the distillation column of Ireland are not a critical component.

As stated above, the products produced in the two processes are different and therefore, the process conditions must be different.

It is thus respectfully submitted that Ireland et al does not at all teach or even

remotely suggest operating its distillation column in a fashion such that there is no thermal degradation of the feedstock or of the wax products, in order to obtain usable wax products.

There is no basis for the examiner's statement that it would be obvious to modify the disclosure of Ireland. To establish *prima facie* obviousness, all of the claim limitations must be taught or suggested in the prior art. *In re Royka*, 490 F. 2d. 981 , 180 USPQ 580 (CCPA 1974). There is no suggestion in Ireland to operate the distillation column so that there is no thermal degradation of the feedstock. Therefore, it is respectfully requested that this rejection be withdrawn.

The Examiner has rejected claim 6 as being obvious over the combination of Ireland and Farnham. This rejection is respectfully traversed.

In view of the arguments presented above and the amendment to claim 1, it is clear that claim 6 is not obvious over these references and it is respectfully requested that this rejection be withdrawn.

Applicants submit that the present application is in condition for allowance and favorable consideration is respectfully requested.

Respectfully submitted,

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1. (twice amended) A process for distilling paraffinic hydrocarbons comprising the steps of:

feeding a Fischer-Tropsch derived paraffinic hydrocarbon feedstock comprising heavy paraffinic hydrocarbons and, optionally, light paraffinic hydrocarbons, medium paraffinic hydrocarbons or a mixture thereof, into a distillation column;

[operating the distillation column to produce usable wax products; and] withdrawing from the distillation column an overhead stream, a bottom stream comprising [usable] wax products, and at least one side stream comprising [usable] wax products; and

operating the distillation column so that there is no thermal degradation of the feedstock or of the wax products, with the wax products of the bottom stream and of the side stream thus being usable wax products.